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Thomas C Webster
Blakely Sokoloff Taylor & Zafman LLP
7th Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025

EXAMINER	
MOORE, IAN N	

ART UNIT	PAPER NUMBER
2661	3

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Please find below and/or attached an Office communication concerning this application or proceeding.

KS

Office Action Summary	Application No.	Applicant(s)	
	09/638,169	DUFFY ET AL.	
	Examiner	Art Unit	
	Ian N Moore	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-22 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buskens '871 in view of well established teaching in art.

Regarding claim 1, Buskens '871 discloses a system comprising: a source node (see Fig. 1, Sender S (or) a root node; col. 3, line 16) configured to transmit a data packet to a target node (see Fig. 1, Receiver R (or) a leaf node; col. 3, line 18) across a data network (see Fig.1, data network consist of regions 101, 102, 103) said source node having a first retry timer set to a first retry time period (see Fig. 2, T_retx) after which said source node will retransmit a data packet (see Fig. 2, Retransmit) if it has not received an appropriate response to said data packet (see Fig. 3A Sender scheduler, T_retx expires at step 303; col. 4, line 28-39; col. 6, line 46 to col. 7, line 14, and col. 5, line 43-67; note that retransmission from Sender occurs upon receiving a status acknowledgement packet(s) and/or expiration of retransmitting timer from receivers and/or designated receivers. Also, see col. 11, line 40-57, note that various timers are used in the sender, receivers and DR with time-out interval for each function); and

a first intermediate node (Fig. 1, Routers RT and Designated Receiver DR 104 (or) an intermediate node; col. 3, line 17) electrically positioned between said source node and said target node, said first intermediate node having a second retry timer set to a second retry time period after which said first intermediate node will retransmit said data packet if it has not received an appropriate response to said data packet (see Fig. 19B, Designated Receiver (DR), T_retx process at step 305, and col. 10, line 39 to col. 11, line 57; note that Designated receiver has both sender and receiver functions. Thus, the function and operation of DR is identical to the sender. Note that retransmission from the sender occurs upon receiving a status acknowledgement packet(s) and/or expiration of retransmitting timer from receivers and/or designated receivers. Also, see col. 11, line 40-57; note that various timers are used in the sender, receivers and DR with time-out interval for each function.)

Buskens '871 does not explicitly disclose said first retry time period is longer than said second retry time period. However, this limitation is well known in the art. In particular, retransmission from the sender upon receiving negative acknowledgement and/or after time-out is well known in the art of packet switching. Furthermore, Buskens '871 teaches how to overcome acknowledgement (ACK) implosion problem in multicast distribution by utilizing intermediate node to retransmit lost packets "locally" on behalf of the sender so that it will not be flooded with acknowledgements from every receiver (see col. 3, line 44-65). Buskens '871 also teaches utilizing a plurality of timers/time intervals for retransmission from the sender and designated receivers. Since the intermediate node (i.e. a combined system of both Routers RT and Designated Receiver DR) is located between the receiver and the sender, the time to reach from the sender to the receiver is longer than the time to reach from the

intermediate node to the receiver. Thus, it is obvious that said first retry time period (i.e. time interval between Sender and Receiver) is longer than said second retry time period (i.e. timer interval between DR 105 and Receiver), per well establish teaching in art of packet transmission.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the purpose of overcoming acknowledgement imposing problem by having two retransmission timers (i.e. one at the sender and the other at the intermediate node), where one time interval is longer than the other. The motivation being that by utilizing separate timer for intermediate node, which is capable of sending and receiving on behalf of the sender, it can reduce end-to-end delay and improve latency.

Regarding claim 2, Buskens '871 discloses a second intermediate node (see Fig. 1, Router RT and Designated Receiver DR 104(or) an intermediate node; also see col. 3, line 17) electrically positioned between first intermediate node and said target node, said second intermediate node having a third retry timer set to a third retry time period after which said second intermediate node will retransmit said data packet if it has not received an appropriate response to said data packet (see Fig. 19B, Designated Receiver (DR), T_retx process at step 305, and col. 10, line 39 to col. 11, line 57; note that Designated receiver has both sender and receiver functions. Thus, the function and operation of DR is identical to a sender. Note that retransmission from a DR occurs upon receiving a status acknowledgement packet(s) and/or expiration of retransmitting timer from receivers. Per Fig. 1, all acknowledgement responses (i.e. dotted lines) are transmitted to DR 104, and DR 104 transmits an acknowledgment

response back to DR 105. Therefore, DR 104 is between DR 105 and receivers. DR 104 is within a local group (i.e. group 101) that belongs to DR 105 (i.e. group 105). Also, see col. 11, line 40-57; note that various timers are used in the sender, receivers and DR with time-out interval for each function.).

Buskens '871 does not explicitly disclose third retry time period is shorter than said second retry time period. However, this limitation is well known in the art of packet transmission. In particular, retransmission from the DR upon receiving negative acknowledgement and/or after time-out is well known in the art of packet switching. Furthermore, Buskens '871 teaches how to overcome acknowledgement (ACK) implosion problem in multicast distribution by utilizing intermediate node to retransmit lost packets "locally" on behalf of the sender so that it will not be flooded with acknowledgements from every receiver (see col. 3, line 44-65). Note that DR 105 is performing a "sender" operation. Buskens '871 also teaches utilizing a plurality of timers/time interval for retransmission from DR and receivers. Since the second intermediate node (i.e. a combined system of both Routers RT and Designated Receiver DR 104) is located between the receiver and the DR 105, the time to reach from DR 105 to the receiver in local network 101 is longer than the time to reach from DR 104 to the receiver. Thus, it is obvious that said second retry time period (i.e. time interval between DR 105 and Receiver in DR 104 local network 101) is longer than said third retry time period (i.e. timer interval between DR 105 and Receiver in DR 104 local network 101), per well-established teaching in art of packet transmission.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 1.

Regarding claim 3, Buskens '871 discloses said first, second and third retry timers are set by said data packet transmitted from said source node (see Buskens '871 col. 11, line 58 to col. 12, line 10; note that Buskens '871 teaches retransmission timers at a sender and DRs as described above in Claims 1-2. Buskens '871 further teaches retransmit timers (T_retx) are set base upon T_send timer, which is triggered by the sender and/or DR during packet transmission. Also, it is well known in art of packet transmission that both sender and receiver must keep track of the packet's departure and arrival within a predetermined sliding window size (i.e. timer or duration) during transmission in order to retransmit missing or lost packets and provide reliable service. Therefore, it is clear that a packet transmitted from a sender/DR must trigger the retransmission timer.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 1.

Regarding claim 4, Buskens '871 discloses said source node is configured to retransmit said data packet a first predetermined number of times if it has not received an appropriate response to said data packet (see Buskens '871 col. 7, line 1-26 and see Fig. 3A; note that a sender retransmits missing/lost packet per request from the receiver and wait for

the acknowledgement. If the receivers (i.e. slow receivers) request that they did not receive the packet, the immediate retransmission occurs. Per Fig. 3A, the retransmission occurs a number of times until the request receiver receives all requested packets. The retransmission process (i.e. Start Retransmitted 305) from the sender will stop only if the receivers acknowledge that they receive all requested packets (i.e. Wait State SP_ON).)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 1.

Regarding claim 5, Buskens '871 discloses said intermediate node is configured to retransmit said data packet a second predetermined number of times if it has not received an appropriate response to said data packet (see Buskens '871 col. 7, line 1-26 and see Fig. 3A; Buskens '871 teaches that intermediate node (i.e. Designated Receiver, DR) has a functionality and capability of both sender and receiver as described above in Claims 1-4. Note that a DR retransmits missing/lost packet per request from the receiver and wait for the acknowledgement. If the receivers (i.e. slow receivers) request that they did not receive the packet, the immediate retransmission occurs.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 1.

Regarding claim 6, it is well known in the art of packet transmission that said first predetermined number of times is greater than said second predetermined number of times. Note that retransmission time period at a sender is greater than first designated receiver DR 105, and retransmission time period at first designated receiver DR 105 is greater than a second designated receiver DR 104 as described above in Claims 1-3. Since the first time period is greater than second time period, it is obvious that the first predetermined number of times must be greater than the second predetermined number of time in order to avoid collision. Furthermore, it is obvious that the lesser time period, the lesser number of retransmissions occurs, and the more time period, the greater number of retransmissions occurs.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 1.

Regarding claim 7, Buskens '871 discloses that said second intermediate node is a proxy agent and said first intermediate node is a proxy repeater (see Buskens '871 col. 10, line 39-46). Note that Buskens '871 teaches a sender, designated receivers, and receivers. Since designated receiver performs function and operation on behalf of a sender, it is clear that it has the "proxy" and "agent" functionality. Moreover, designated receiver has an identical functionality of both sender and receiver, and it is capable to retransmit the packets. Thus, it is also clear that the designated receiver has the "repeater" functionality.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 1.

2. Claims 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buskens '871 in view of Rothschild (U.S. 5,822,523).

Regarding claim 8, Buskens '871 discloses a system for providing proxy communication for a standard set of network commands comprising:

a source node (see Fig. 1, Sender S (or) a root node; col. 3, line 16) sending a packet in which one of said standard network commands (see col.6, line 61-66; retransmission requests/acknowledgments are the "standard network commands") to an agent node (Fig. 1, a combined system of Router RT and Designated Receiver DR 104; col. 4, line 29-36; col. 4, line 28-39; col. 6, line 46 to col. 7, line 14, and col. 5, line 43-67; note that a sender retransmits a packet to Routers RT and Designated Receiver DR per retransmission requests/acknowledgments),

said agent node communicating with a target node (see Fig. 1, Receiver R (or) a leaf node; col. 3, line 18) using said standard network command (see Fig. 19B, Designated Receiver (DR), T_retx process at step 305, and col. 10, line 39 to col. 11, line 57; note that Designated receiver has both sender and receiver functions. Thus, the function and operation of DR is identical to the Sender. Note that DR re-multicasts and retransmits a packet to a receiver per retransmission requests/acknowledgments.)

Buskens '871 does not explicitly discloses a source node (see Rothschild '523 Fig. 2, Host A sends 20; Host A) attaching a proxy header (see Rothschild '523 Fig. 2, Host A sends 20; attaching address B to the header) to a packet in which data is encapsulated (see Rothschild '523 Fig. 2, Host A sends 20; a data packet P1 which is encapsulated), said proxy header identifying an agent node (see Rothschild '523 Fig. 2, Host A sends 20; Address B is the agent node),

said agent node receipt of said packet with said proxy header (see Rothschild '523 Fig. 2, Host B receives 20; host B receives a packet P1 with a header B as destination address; also see col. 2, line 53 to col. 4, line 14).

However, this limitation is taught by Rothschild '523. Note that Buskens '871 teaches a sender, designated receiver, and receiver. Since designated receiver performs function and operation on behalf of a sender and it has an identical functionally of both sender and receiver, it is clear that it is a "proxy agent node". The re-multicasting/retransmission function and operation are performed at designated receiver upon receiving requests from both sender and receiver. Rothschild '523 teaches how to encapsulate data into a packet, by adding a source and destination addresses in header. In particular, the source address is the "source node/sender" address and the destination address is the "next node/destination node". Thus, Buskens '871's sender can encapsulate request/acknowledgment data into a packet and transmit to the designated receiver per Rothschild '523 teaching. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 in view of Rothschild '523 for the purpose of facilitating efficient communications between multiple

host computers over a conventional wide area communications network, see Rothschild '523 col. 8, line 21-25. The motivation being that by utilizing source and destination address in the header, a packet can be routed more effectively, which can reduce the end-to-end delay and improved latency.

3. Claims 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buskens '871 and Rothschild '523, as applied to claim 8 above, and further in view of Rekhter (U.S. 5,917,820).

Regarding claim 9, Buskens '871 discloses a first repeater node (Fig. 1, Routers RT and Designated Receiver DR 105(or) an intermediate node; col. 3, line 17) electrically positioned between said agent node and said source node (see Fig. 19B, Designated Receiver (DR), T_retx process at step 305, and col. 10, line 39 to col. 11, line 57; note that DR has both sender and receiver functions. Thus, the function and operation of DR is identical to a "repeater". Retransmission from a DR occurs upon receiving a status acknowledgement/request packet(s) and/or expiration of retransmitting timer from receivers. Rothschild '523 teaches encapsulation of data into a header, adding source and destination address and transmitting toward next node (i.e. DR 104)).

Neither Buskens '871 nor Rothschild '523 explicitly discloses said first repeater node (see Rekhter '820 Fig.3 inter-domain router R 310 or R308) to forward said packet to said agent node (see Rekhter '820 Fig. 3, inter-domain router R312 or 314; and col. 4, line 33-41

and col. 7, line 66 to col. 8, line 29; note that each router forward the packet to the next node based upon network address which is embedded within a header).

However, this limitation is taught by Rekhter '820. Note that Buskens '871 teaches retransmitting a packet from one intermediate node to the other. Rothschild '523 teaches encapsulation of data into a header, which consists of a source and destination addresses. Rekhter '820 teaches forwarding a packet from one domain to the other based upon the network address (i.e. domain address). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Buskens '871 and Rothschild '523, as taught by Rekhter '820, for the purpose of providing an efficient and accurate means for forwarding packets through a router to provide quick reliable communication among nodes of an inter-network; see Rekhter '820 col. 5, line 11-15. The motivation being that by re-routing/forwarding the packet according to the network address, it can increase reliability of the packet transmission network.

Regarding claim 10, the combined system of Buskens '871, Rothschild '523, and Rekhter '820 discloses first repeater node forwarding said packet with said proxy header as described above in Claim 9. Furthermore, Rekhter '820 discloses a node is configured to remove its address from header before forwarding (see Rekhter '820 Fig. 7 step 720; see col. 14, line 27 to col. 15, line 4; note that each intra-domain and inter-domain performs forwarding and tagging methods as described in Fig. 7. Thus, each router (i.e. first repeater) retrieves a tag from the header (i.e. a tag is the "network" address of a first repeater), and performs the matching according to the routing table index in order to forward the packet.

Once the next hop/node (i.e. Agent node) is found in the index, the router places a next hop/node tag (i.e. Agent network address) in the header. Note that in order to place a new tag in header, the old tag must be removed.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Buskens '871, Rothschild '523 as taught by Rekhter '820 for the same reason as described above in Claim 9.

Regarding claim 11, Rekhter '820 discloses a second repeater node (see Rekhter '820 Fig. 1 Intra-domain router R 326) electrically positioned between said source node (see Rekhter '820 Fig. 1 source node 342) and said first repeater node (see Rekhter '820 Fig. 1 inter-domain router 310) said second repeater node configured to forward said packet to said first repeater node (see Rekhter '820 Fig. 3, inter-domain router R312 or 314; and col. 4, line 33-41 and col. 7, line 66 to col. 8, line 29; note that each router forward the packet to the next node based upon network address which is embedded within a header. In particular, a packet targeted to destination node 346 is forwarded via Router 326 (i.e. second repeater) to Router 310/308 (i.e. first repeater). Since each router performs the operation of "forwarding" packets to destination node, it is clear that they have a functionality of "repeaters".)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Buskens '871, Rothschild '523 as taught by Rekhter '820 for the same reason as described above in Claim 9.

Regarding claim 12, the combined system of Buskens '871, Rothschild '523, and Rekhter '820 discloses second repeater node forwarding said packet with said proxy header as described above in Claims 1-11. Furthermore, Rekhter '820 discloses a node is configured to remove its address from header before forwarding (see Rekhter '820 Fig. 7 step 720; see col. 14, line 27 to col. 15, line 4; note that each intra-domain and inter-domain performs forwarding and tagging methods as described in Fig. 7. Thus, each router (i.e. second repeater) retrieves a tag from the header (i.e. a tag is the "network" address of a second repeater), and performs the matching according to the routing table index in order to forward the packet. Once the next hop/node (i.e. first repeater) is found in the index, the router places a next hop/node tag (i.e. first repeater's network address) in the header. Note that in order to place a new tag in header, the old tag must be removed.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Buskens '871, Rothschild '523 as taught by Rekhter '820 for the same reason as described above in Claim 9.

Regarding claim 13, Buskens '871 discloses said first repeater (see Buskens '871 Fig. 1 DR 105) is further configured to store address data for a return path to said source node communicate via a return path to said source node (see Buskens '871 Fig. 1 an acknowledgement path to Sender S; and see col. 5, line 45-53; a retransmit queue at DR/Sender stores addresses for requesting receivers.), and forwarding said target node's response to said packet (see Fig. 1, responses from receiver R; also see col. 4, line 32-36, and

col. 9, line 4-15; note that each receiver (i.e. target node) sends acknowledgement status response packets to a sender (i.e. a source node) via DR 105 (i.e. first repeater).)

Rekhter '820 discloses storing address data for each path (i.e. forward and reverse paths) said address data used for forwarding said target node's response to said packet (see Rekhter '820 Fig. 5 Next Hop tag database; see col. 9, line 10-64; note that each router has an index table which stores a packet address information (i.e. MAC address, next hop address, destination address, SAP address, and etc.) so that each packet can be routed/forwarded accordingly.)

Thus, Buskens '871's teaches that DR has a capability of storing addresses for each receiver which sends acknowledgement/response to a sender/DR. Rekhter '820 teaches storing a routing table for each packet. Thus, Buskens '871's DR can be provisioned to store receiver and sender addresses in order to route/forward a packet, per Rekhter '820 teachings. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Buskens '871, Rothschild '523 as taught by Rekhter '820 for the same reason as described above in Claim 9.

Regarding claim 14, Buskens '871 discloses a repeater (see Buskens '871 Fig. 1 Intra-domain router R) is further configured to store address data for a return path to said source node communicate via a return path to said source node (see Buskens '871 Fig. 1 an acknowledgement path to Sender S; and see col. 5, line 45-53; a retransmit queue at DR/Sender stores addresses for requesting receivers.), and forwarding said target node's response to said packet (see Fig. 1, responses from receiver R; also see col. 4, line 32-36, and

col. 9, line 4-15; note that each receiver (i.e. target node) sends acknowledgement status response packets to a sender (i.e. a source node) via DR (i.e. repeater).)

Rekhter '820 discloses a second repeater (see Rekhter '820 Fig. 1 Intra-domain router R 326) storing address data for each path (i.e. forward and reverse paths) said address data used for forwarding said target node's response to said packet (see Rekhter '820 Fig. 5 Next Hop tag database; see col. 9, line 10-64; note that each router has an index table which stores a packet address information (i.e. MAC address, next hop address, destination address, SAP address, and etc.) so that each packet can be routed/forwarded accordingly.)

Thus, Buskens '871's teaches that DR has a capability of storing addresses for each receiver which sends acknowledgement/response to the sender/DR. Rekhter '820 teaches storing a routing table for each packet. Thus, Buskens '871's DR can be provisioned to store receiver and sender addresses in order to route/forward a packet between them, per Rekhter '820 teachings. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Buskens '871, Rothschild '523 as taught by Rekhter '820 for the same reason as described above in Claim 9.

Regarding claim 15, Buskens '871 discloses said standard network command is a request/ response command (see Buskens '871 col. 5, line 43-53; retransmission requests and col. 6, line 58-60, acknowledge messages).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Buskens '871, Rothschild '523 as taught by Rekhter '820 for the same reason as described above in Claim 9.

4. Claims 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buskens '871 in view of well established teaching in art.

Regarding claim 16, Buskens '871 discloses a method for providing transaction control between a source node (see Fig. 1, Sender S (or) a root node; also see col. 3, line 16) and a target node (see Fig. 1, Receiver R (or) a leaf node; col. 3, line 18), said source node and said target node communicating across one or more repeater nodes (see Fig. 1, Routers RTs and Designated Receivers DRs), the method comprising:

transmitting a data command from said source node to a first repeater node (Fig. 1, Routers RT and Designated Receiver DR 104 (or) an intermediate node; also see col. 3, line 17), said first repeater node configured to transmit said data command to said target node (see Fig. 19B, Designated Receiver (DR), T_retx process at step 305, and col. 10, line 39 to col. 11, line 57; DR has both sender and receiver functions. Thus, the function and operation of DR is identical to a Sender. Note that DR re-multicasts and retransmits a packet to a receiver per retransmission acknowledgements/requests);

retransmitting said data command from said source node to said first repeater node if said source node has not received an appropriate response within a first time period (see Fig. 3A Sender scheduler, T_retx expires at step 303; col. 4, line 28-39; col. 6, line 46 to col. 7, line 14, and col. 5, line 43-67; note that retransmission from the sender occurs upon receiving a status acknowledgement packet(s) and/or expiration of retransmitting timer from receivers

and/or designated receivers. Also, see col. 11, line 40-57, note that various timers are used in the sender, receivers and DR with time-out interval for each function.); and

retransmitting said data command from said first repeater node to said target node if said first repeater node has not received an appropriate response from said target node within a second time period (see Fig. 19B, Designated Receiver (DR), T_retx process at step 305, and col. 10, line 39 to col. 11, line 57; DR has both sender and receiver functions. Thus, the function and operation of DR is identical to the sender. Note that retransmission from Sender occurs upon receiving a status acknowledgement packet(s) and/or expiration of retransmitting timer from receivers and/or designated receivers. Also, see col. 11, line 40-57; note that various timers are used in the sender, receivers and DR with time-out interval for each function.)

Buskens '871 does not explicitly disclose said first retry time period is longer than said second retry time period. However, this limitation is well known in the art. In particular, retransmission from the sender upon receiving negative acknowledgement and/or after time-out is well known in the art of packet switching. Furthermore, Buskens '871 teaches how to overcome acknowledgement (ACK) implosion problem in multicast distribution by utilizing intermediate node to retransmit lost packets "locally" on behalf of the sender so that it will not be flooded with acknowledgements from every receiver (see col. 3, line 44-65). Buskens '871 also teaches utilizing a plurality of timers/time interval for retransmission from the sender and designated receivers. Since the intermediate node (i.e. a combined system of both Routers RT and Designated Receiver DR) is located between the receiver and sender, the time to reach from the sender to receiver is longer than the time to reach from the

intermediate node to the receiver. Thus, it is obvious that said first retry time period (i.e. time interval between Sender and Receiver) is longer than said second retry time period (i.e. timer interval between DR 105 and Receiver), per well-established teaching in art of packet transmission.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the purpose of overcoming acknowledgement imposing problem by having two retransmission timers (i.e. one at the sender and the other at the intermediate node), where one time interval is longer than the other. The motivation being that by utilizing separate timer for intermediate node, which is capable of sending and receiving on behalf of the sender, it can reduce end-to-end delay and improve latency.

Regarding claim 17, Buskens '871 discloses transmitting said data command from said first repeater node to a second repeater node (Fig. 1, Router RT and Designated Receiver DR 104 (or) an intermediate node; col. 3, line 17), said second repeater node configured to transmit said data command to said target node (see Fig. 19B, Designated Receiver (DR), T_retx process at step 305, and col. 10, line 39 to col. 11, line 57; note that each Designated receiver has both sender and receiver functions. Thus, the function and operation of DR is identical to a sender. Note that each DR re-multicasts and retransmits a packet to a receiver per retransmission requests.)

retransmitting said data command from said second repeater node to said target node if said second repeater node has not received an appropriate response to said data command

within a third time period (see Fig. 19B, Designated Receiver (DR), T_retx process at step 305, and col. 10, line 39 to col. 11, line 57; note that Designated receiver has both sender and receiver functions. Thus, the function and operation of DR is identical to a sender. Note that retransmission from a DR occurs upon receiving a status acknowledgement packet(s) and/or expiration of retransmitting timer from receivers. Per Fig. 1, all acknowledgement responses (i.e. dotted lines) are transmitted to DR 104, and DR 104 transmits an acknowledgment response back to DR 105. Therefore, DR 104 is between DR 105 and receivers. DR 104 is within a local group (i.e. group 101) that belongs to DR 105 (i.e. group 105). Also, see col. 11, line 40-57; note that various timers are used in the sender, receivers and DR with time-out interval for each function.)

Buskens '871 does not explicitly disclose third time period is shorter than said second time period. However, this limitation is well known in the art of packet transmission. In particular, retransmission from the DR upon receiving negative acknowledgement and/or after time-out is well known in the art of packet switching. Furthermore, Buskens '871 teaches how to overcome acknowledgement (ACK) implosion problem in multicast distribution by utilizing intermediate node to retransmit lost packets "locally" on behalf of the sender so that it will not be flooded with acknowledgements from every receiver (see col. 3, line 44-65). Note that DR 105 is performing a "sender" operation. Buskens '871 also teaches utilizing a plurality of timers/time interval for retransmission from DR and receivers. Since the second intermediate node (i.e. a combined system of both Routers RT and Designated Receiver DR 104) is located between the receiver and the DR 105, the time to reach from DR 105 to receiver in local network 101 is longer than the time to reach from DR

104 to the receiver. Thus, it is obvious that said second retry time period (i.e. time interval between DR 105 and Receiver in DR 104 local network 101) is longer than said third retry time period (i.e. timer interval between DR 105 and Receiver in DR 104 local network 101), per well-established teaching in art of packet transmission.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 16.

Regarding claim 18, Buskens '871 discloses said first, second and third retry timers are set by said data packet transmitted from said source node (see Buskens '871 col. 11, line 58 to col. 12, line 10; note that Buskens '871 teaches retransmission timers at a sender and DRs as described above in Claims 16-17. Buskens '871 further teaches retransmit timers (T_retx) are set base upon T_send timer, which is triggered by the sender and/or DR during packet transmission. Also, it is well known in art of the packet transmission that both sender and receiver must keep track of the packets departure and arrivals within a predetermined sliding window size (i.e. timer or duration) during transmission in order to retransmit missing or lost packets and provide reliable service. Therefore, it is clear that a packet transmitted from a sender/DR must trigger the retransmission timer.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 16.

Regarding claim 19, Buskens '871 discloses said source node is configured to retransmit said data packet to said first repeater node a first predetermined number of times if it has not received an appropriate response to said data packet (see Buskens '871 col. 7, line 1-26 and see Fig. 3A; note that a sender retransmits missing/lost packet per request from the receiver and wait for the acknowledgement. If the receivers (i.e. slow receivers) request that they did not receive the packet, the immediate retransmission occurs. Per Fig. 3A, the retransmission occurs a number of times until the request receiver receives all requested packets. The retransmission process (i.e. Start Retransmitted 305) from the sender will stop only if the receivers acknowledge that they receive all requested packets (i.e. Wait State SP_ON).)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 16.

Regarding claim 20, Buskens '871 discloses said first repeater node is configured to retransmit said data packet to said target node a second predetermined number of times if it has not received an appropriate response to said data packet (see Buskens '871 col. 7, line 1-26 and see Fig. 3A; Buskens '871 teaches that intermediate node (i.e. Designated Receiver, DR) has a functionality and capability of both sender and receiver as described above in Claims 16-19. Note that a DR retransmits missing/lost packet per request from the receiver and wait for the acknowledgement. If the receivers (i.e. slow receivers) request that they did not receive the packet, the immediate retransmission occurs.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 16.

Regarding claim 21, it is well known in the art of packet transmission that said first predetermined number of times is greater than said second predetermined number of times. Note that retransmission time period at a sender is greater than first designated receiver DR 105, and retransmission time period at first designated receiver DR 105 is greater than a second designated receiver DR 104 as described above in Claims 16-18. Since the first time period is greater than second time period, it is obvious that the first predetermined number of times must be greater than the second predetermined number of time in order to avoid collision. Furthermore, it is obvious that the lesser time period, the lesser number of retransmissions occur, and the more time period, the greater number of retransmissions occurs.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 16.

Regarding claim 22, Buskens '871 discloses that said second intermediate node is a proxy agent and said first intermediate node is a proxy repeater (see Buskens '871 col. 10, line 39-46). Note that Buskens '871 teaches a sender, designated receivers, and receivers. Since designated receiver performs function and operation on behalf of a sender, it is clear

that it has the "proxy" and "agent" functionality. Moreover, designated receiver has an identical functionality of both sender and receiver, and it is capable to retransmit the packets. Thus, it is also clear that the designated receiver has the "repeater" functionality.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Buskens '871 as taught by well established teaching in art for the same reason as described above in Claim 16.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian N Moore whose telephone number is 703-605-1531. The examiner can normally be reached on M-F: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doug Olms can be reached on 703-305-4703. The fax phone number for the organization where this application or proceeding is assigned is 703-305-9509.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Ian N Moore
Examiner
Art Unit 2661

INM
11/12/03

KENNETH VANDERPUYE
PRIMARY EXAMINER